

AMENDMENTS TO THE SPECIFICATION - IN THE SUMMARY OF THE INVENTION

1 The invention is a novel design of such a reusable hub for securing and removing a
2 disposable core made to fit to a standard valve, Luer or Luer lock type and attached to a hose
3 leading from a pump that is connected to a reservoir of liquid. A nozzle hub comprises:
4 A cylindrically-shaped wall extending downward to an exterior groove, then outward to a break
5 point defined by a hexagonal shape spaced apart from said exterior groove, downward there-
6 from along the faces to an adjacent fund-us which has a hexagonal perimeter; an interior
7 cylindrically-shaped barrel wall made with a slight inward slant or cast and extends downward
8 from the upper surface to said fund-us; a groove with a ledge defined by a vertical perimeter and
9 a flare extending inward from said perimeter; the top side of the groove is used to pull the seated
10 nozzle core from the Luer or Luer lock type taper; a longitudinal slot descending along the hub
11 set inward at an acute angle; a horizontal furrow intersecting said groove and spaced tangent to
12 said ledge defined by a vertical perimeter and a flare extending inward from the perimeter.
13 Wherein there is a controlled ratio of the ~~external~~ diameter of said interior cylindrically shaped
14 barrel wall made with a slight inward slant or cast measured at any elevation between the
15 tangency point at the intersection of the flare extending inward from the perimeter and the fund-
16 us and the width of said longitudinal slot descending along said hub set inward at an acute angle
17 measured at an identical elevation of greater than 0.5. The nozzle hub for securing a nozzle core,
18 wherein a longitudinal slot extending downward along said hub, a nozzle core is compressed
19 through the slot, sliding along a horizontal furrow intersecting a groove and spaced tangent to a
20 ledge defined by a vertical perimeter, expanding to locate the nozzle core on the flare extending
21 inward from said perimeter. Currently, two designs exist for the hub. The concept behind each
22 design is different, according to the sensitivity of the dispensing process to the thermal response
23 rate. Initially, hubs were brazed to the core enabling fast heat transfer from the hub to the core.
24 This design trades increased cost for superior advantage in thermal response rate.

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1 Accordingly, the main object of this invention is a novel nozzle hub that can be removed from
2 the nozzle core and reused, reducing cost to the consumer by allowing replacement of the
3 contiguous core held by the hub. The hub is retained to use for holding the next core. The hub
4 can be made from any material but those made for use in a heated application contain a high
5 percentage of copper. The nozzle hub permits disposal of nozzle core alone, reducing waste and
6 allows the nozzles to be made more economically and more useful in the relevant industry.

7 These and other objects of the invention will become clearer when one reads the
8 following specification, taken together with the drawings that are attached hereto. The scope of
9 protection sought by the inventor may be gleaned from a fair reading of the Claims that conclude
10 this specification.

AMENDMENTS TO THE SPECIFICATION - IN THE DESCRIPTION OF THE DRAWINGS - FIGURES

Turning now to the drawings wherein elements are identified by numbers and like elements are identified by like numbers throughout the ~~[[six]]~~ seven figures, the novel design of a reusable nozzle hub 1 is depicted in **Figures 1-4**. **Figure 1** is an illustrative view of the invention from an elevated vantage point; **Figure 2** is an illustrative eye level view of the invention. **Figure 3** is an illustrative close up view of a detail shown in **Figures 1 and 2**. **Figure 4** is an illustrative section view of the interior groove 10 with a ledge 11 of the nozzle hub 1. **Figure 5** shows the nozzle hub 16 used when a permanent brazed connection is desired next to the novel reusable hub 1. **Figure 6** is a front view of the nozzle core 17 that fits the brazed hub 16 or the reusable hub 1. **Figure 7** is an illustrative view from an elevated vantage point of the reusable hub 1 and nozzle core 17 connected to a reservoir 18.

AMENDMENTS TO THE SPECIFICATION - IN THE DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein the showings are for the purpose of illustrating preferred embodiments of the invention only and not for the purpose of limiting it. The invention is a novel design for a nozzle hub 1 depicted in **Figure 1** that enables removal of the nozzle core 17 shown in **Figure 6** for replacement. It is preferred that the hub 1 be made in one, monolithic unit that surrounds, supports and secures the nozzle core 17 to increase the resistance of the core 17 to deformation or strain that occurs due to force from pressure acting on the interior surface area. A flared wall 12 locates the core 17 in relation to the Lure threaded hub for both reusable mechanical hub and brazed hub connection assemblies. **Figure 5** is a side-by-side illustration of the hub 16 brazed to the nozzle core 17 and the nozzle core 17 installed in the reusable hub 1. The concept behind each design is different, according to the sensitivity of the dispensing process to the thermal response rate. In the first nozzle hub design 16, the hub 16 is brazed to the nozzle core 17 enabling fast heat transfer from the hub 16 to the core 17. This design trades increased cost for superior advantage in thermal response rate. The second design separates nozzle core 17 from nozzle hub 1 reducing cost to the customer by allowing replacement of the contiguous core 17 held by the hub 1. The hub 1 is retained to use for holding the next core 17. This design trades the advantage in thermal response rate to gain an advantage in cost.

~~Turning now to the drawings wherein elements are identified by numbers and like elements are identified by like numbers throughout the three figures, the~~ The inventive nozzle hub 1 is depicted in **Figures 1-3**, in vertical or near vertical attitude and in **Figure 4** in horizontal attitude and comprises a exterior cylindrically shaped barrel wall 2 extending downward about 7 to 8 millimeters to an exterior groove 3 that spans 1 millimeter then outward to a break point defined by a hexagonal shaped barrel wall 2 extending downward to an exterior groove 3 then outward to a break point defined by a hexagonal shape spaced apart from the groove 3 at about 30 degrees 4. The purpose of the groove 3 is to aid in installation of a device that applies heat to the fund-us 6. An exterior cylindrically shaped barrel wall 2 performs the function of securing the nozzle hub 1 and nozzle core 17 to a reservoir 18 from which a viscous fluid is transferable, **Figure 7**.

AMENDMENTS TO THE SPECIFICATION - IN THE DESCRIPTION OF THE PREFERRED EMBODIMENT

1 Extending downward there-from along the faces 5 to an adjacent fund-us with a
2 hexagonal perimeter 6 is about 4 to 6 millimeters. Faces 5 of the hexagonal shape measure
3 between 5 and 25 millimeters and more preferably about 8-12 millimeters between parallel faces
4 5 facilitate use of a wrench for application of torque to the hub for installation and removal and
5 increase surface area for convective transfer of thermal energy.

6 An interior cylindrically shaped barrel wall 7 is made with a slight inward cast or slant
7 such as between 1 and 5 degrees and more preferably between 2 and 4 degrees from upper
8 surface 8 to a fund-us 6. It is further preferred that the interior cylindrically shaped barrel wall
9 be made circular and limited to about 25 millimeters in diameter. This helps to support and align
10 the nozzle core 17 to form a leak proof connection to the Luer taper. A groove 10 with a ledge
11 11 and a flare 12 extending inward from the perimeter 13 is intersected by a horizontal furrow 9
12 that is about 0.5 to 0.75 millimeters across and about 1 or 2 millimeters from the top circular
13 surface 8. The horizontal furrow 9 originates from a flat surface 15 recessed below the
14 cylindrically shaped wall 2 extending upward to the top circular surface 8.

15 The longitudinal slot 14 extends downward along the hub 1 set inward at an acute angle
16 is parallel to the interior cylindrically shaped barrel wall 7 and has a wall convergence between
17 about 6 to 8 degrees included. The ratio of the diameter of the interior cylindrically shaped
18 barrel wall 7 measured at any elevation between the tangency point at the intersection of the flare
19 extending inward from the perimeter 19 and the fund-us 6 to the width of the longitudinal slot 14
20 descending along the hub 1 set inward at an acute angle measured at an identical elevation
21 exceeds 0.5. The longitudinal slot 14 extends downward along the hub 1; the nozzle core is
22 compressed moving through the slot 14, sliding along the horizontal furrow 9 intersecting the
23 groove 10, spaced tangent to the ledge 11 defined by the vertical perimeter 10, expanding to
24 locate the nozzle core on the flare 12, extending inward from the vertical perimeter 13.

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1 In the preferred embodiment of the invention, for applications that require a heated fluid
2 path, it is preferred that nozzle hub 1 be made from a thermally conductive material, such as
3 copper. More particularly, it is preferred that thermally conductive material, such as copper
4 comprises at least 90% by weight of metal for the best thermal response. Nozzle hubs 1 used in
5 applications where heat is not necessary can be made of any material that ~~is suitable~~ can be
6 machined or molded.

7 While the invention has been described with reference to a particular embodiment
8 thereof, those skilled in the art will be able to make various modifications to the described
9 embodiment of the invention without departing from the true spirit and scope thereof. It is
10 intended that all combinations of elements and steps, which perform substantially the same
11 function in substantially the same way to achieve substantially the same result, be within the
12 scope of this invention.